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ATTACHMENT
for Work Plan OU-5 Woman Creek Priority Drainage

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Any questions please call Carlotta Muheim at 966-3893.

9.0 ENVIRONMENTAL EVALUATION

9.1 INTRODUCTION

The objective of this Environmental Evaluation Work Plan is to provide a framework for addressing and quantifying the ecological effects to the biotic environment (plants, animals, microorganisms) from exposure to contaminants resulting from IHSSs within the Woman Creek Drainage, OU5. An ecosystem approach will be used as the basis for this environmental evaluation to ensure that ecological effects or endpoints (e.g., structural diversity, biomass, phenology, nutrient cycling, trophic structure) are addressed as well as populations and individuals that are more traditionally evaluated in a risk assessment approach (U.S. EPA 1989d). The ecosystem approach is comprehensive in that it initially addresses all ecosystem components, then progressively focuses on those aspects of the system potentially affected by contamination. The result of this process will be an evaluation of the nature and extent of contamination in biota, its relationship to abiotic sources, and the type and extent of adverse effects at the ecosystem, population, and individual levels of organization, as appropriate.

This plan is prepared in conformance with the requirements of current applicable legislation, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and follows the guidance for such studies as provided in the National Contingency Plan (NCP) and Environmental Protection Agency (EPA) documents for the conduct of Resource Conservation and Recovery Act (RCRA) Facility Investigation/ Remedial Investigation (RFI/RI) activities. Specifically, the EPA guidance provided in Risk Assessment Guidance for Superfund, Vol. II, Environmental Evaluation Manual (U.S. EPA 1989c) is followed. Although a formal Natural Resource Damage Assessment (NRDA) process has not been initiated at Rocky Flats as of this time, this work plan was also designed to be consistent with the NRDA process to the maximum extent possible.

Determination of the effects on biota will be performed in conjunction with the human health risk assessment for OU5. Where appropriate, criteria necessary for performing the environmental evaluation will be developed in conjunction with human health risk assessments and environmental evaluations for all Rocky Flats Plant operable units (OUs). Information from the environmental evaluation will assist in determining the form, feasibility, and extent of remediation necessary for Woman Creek Drainage in accordance with CERCLA.

During preparation of this work plan, several documents were reviewed as part of an assessment of available information. These included the Final Environmental Impact Statement (EIS), Rocky Flats Plant (U.S. DOE 1980); Wetlands Assessment (EG&G 1990g); Draft Environmental Evaluation Work Plan for OU2 (in RFI/RI Work Plan, EG&G 1991d); and the Final Phase III RFI/RI Work Plan, 881 Hillside Area (U.S. DOE 1990c) among others. Literature reviews will continue throughout the environmental evaluation. Review of this Draft Phase I RFI/RI Work Plan for OU5 and the Environmental Evaluation Work Plans for OU1 (U.S. DOE 1990c) and OU2 (EG&G 1991d) formed the basis for the establishment of the initial sampling locations presented in the OU5 Environmental Evaluation Field Sampling Plan (Subsection 9.3).

9.1.1 Approach

This plan presents a comprehensive approach to conducting the environmental evaluation at Woman Creek Drainage. This comprehensive approach is designed to ensure that all procedures to be performed are appropriate, necessary and sufficient to adequately characterize the nature and extent of environmental effects to biota under the "no action" scenario. The approach presented in this plan is adapted from the toxicity-based approach to the assessment of ecosystem effects (U.S. EPA 1989c, 1989d). The approach is based on standard risk assessment concepts whereby uncertainties concerning potential ecosystem effects are explicitly recognized and, where possible, quantified. The planned approach is also based, to the greatest extent possible, on providing objective estimates of ecological damage and the establishing a firm, causal relationship between contamination and ecological effects. To establish this relationship, the Work Plan focuses on the obtainment of three types of information:

- Chemical - Chemical analyses of appropriate media to establish the presence, concentrations, and variabilities of specific toxic compounds. This effort will be conducted under the RFI/RI abiotic sampling program.

- Ecological - Ecological surveys to characterize the condition of existing communities and establish whether any adverse effects have occurred.

- Toxicological - Toxicological and ecotoxicological testing to establish the link between adverse ecological effects and known contamination.

Without these three types of data, other potential causes of the observed effects on ecosystems unrelated to the presence of contamination, such as habitat alterations and natural variability, cannot be eliminated.

The ecological assessment scheme adopted for this project blends standard environmental and risk assessment methods with ecological and toxicological modeling to produce an integrated procedure for selecting contaminants of concern and indicator species, and for conducting an investigation of ecosystem effects resulting from contamination. As is recommended by EPA, this environmental